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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,555	08/06/2001	Takeji Ueda	212284US3	7054

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EXAMINER	
KORNAKOV, MICHAIL	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 10/01/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

9

Office Action Summary	Application No.	Applicant(s)	
	09/921,555	UEDA ET AL.	
	Examiner	Art Unit	
	Michael Kornakov	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 12-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 12-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Claims 1-6, 12-17 are pending. Claims 1, 2, 4, 6 are currently amended, claims 12-17 are the new claims introduced by Amendment in Paper No. 8.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 3 and 6 stand rejected under 35 U.S.C. 102(b) as being anticipated by GB 2 154 434.

GB'434 teaches a cleaning operation, as a sub-step, which is employed for cleaning circuit boards during the production of printed circuits, the said circuit boards have preliminary been exposed to a plurality of chemical treatments (page 1, lines 6-16; page 2, lines 104-111).

In the process of GB'434 the boards are treated with cleaning liquid (reads on "desired liquid", as instantly claimed), for example fresh water, while being revolved around the axis of rotation 27 at the rotation speed, **wherein the centrifugal effect predominates** and water flows at a great force radially outwards over the surfaces of the circuit boards (page 2, lines 128-130; page 3, line 1; Fig 1 and 2). The said axis of rotation is located outside the boards themselves (Fig 1 and 2). GB'434 specifically indicates that as the result of the rotating movement the cleaning liquid is washed over the board surface (reads on "flowing on a surface of said substrate...under a centrifugal force", as instantly claimed) at considerably high speed of flow than due to the force of

gravity alone (page 1, lines 71-74). Therefore, the limitation, which recites that "a centrifugal force greater than gravitation", is met by GB'434.

GB'434 continues treatment of circuit boards by supplying to the surfaces of revolved boards a heated water (page 3, lines 41-45) (reads on "supplying a fresh liquid of the same kind as said desired liquid", as instantly claimed). GB'434 leaves flow rate of heated water the same compare to the flow rate of cleaning liquid, which reads on the limitation, that "a flow rate of fresh liquid of the same kind is at least equal to a discharge rate of said desired liquid". Because the heated water and cleaning liquid are delivered to printing board surfaces, utilizing the same delivery means, the direction of flow of heated water of GB'434 inherently conforms with the direction of cleaning liquid (Fig 1 and 2). As also seen from Fig 1 and 2, the flows of cleaning liquid do not run against each other.

In specific regard to the limitation of claim 3, which is concerned with conducting the sub-step in an initial stage of chemical processing, it is noticed here, that the definition of "an initial stage" is not provided by the instant disclosure. Therefore, this term is given a broadest possible interpretation. GB'434 teaches further production of printed circuits, utilizing the prepared circuit boards, which includes different processing steps and inherently requires chemical processing. Therefore, the cleaning sub-step of GB'434 is performed on the initial stage of subsequent chemical processing.

Regarding the "fabrication of **semiconductor** devices", which is recited in the preamble of claim 1, it is noted that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process and where the body

of the claim does not depend on the preamble for completeness but, instead, the process steps are able to stand alone, consult ***In re Hirao***, 535 F.2d 67, 190 USPQ 15 (CCPA 1976). In the instant case, while reciting "semiconductor devices" in the preamble, the body of claim 1 discloses "a substrate", which is not depended or connected to "semiconductor devices" and is perfectly readable on any substrate, including circuit boards of GB'434.

Therefore all the limitations of the instant claims 1, 3, and 6 are either expressly or inherently met by the disclosure of GB'434.

4. Claims 2, 4 and 5 stand rejected and new claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'434 in view of Kukanskis et al (U.S. 5,132,038).

The disclosure of GB'434 differs from the instant claims 2, 4 and 5 by the following:

a) not disclosing specifically that cleaning liquid either has high viscosity and/or adhesion **or in the alternative** the cleaning liquid is the one that contains organic substance, as per claim 2;

b) not specifying that the chemical used in the wet treatment method contains amine or ammonium fluoride, **or in the alternative** is a water containing organic solvent/substance, as per claims 4 and 5.

However, GB'434 clearly motivates a person skilled in the art to use other than water cleaning liquid by stating that even though water is used predominantly, any other

cleaning liquid can also be used (col. 3, lines 106, 107). GB'434 goes even further by emphasizing that one of the goals of its cleaning procedure is to remove any chemical substances, which would be troublesome in the subsequent processing of circuit boards and especially the small bores surfaces, in which higher concentrations of such chemical substances remain (page 1, lines 14-19). Thus, GB'434 clearly motivates a skilled artisan to employ cleaning compositions, which are formulated for treatment of circuit boards with through-hole surfaces.

Kukanskis teaches cleaning and/or desmearing the circuit boards with punched through-holes, utilizing an effective and substantially clear mixture comprised a water-immiscible **organic liquid and water**, which can be rinsed from the through-hole surfaces using conventional water rinses (col. 3, lines 21-34; col.4, lines 19-25,35-39).

Because GB'434 is concerned with cleaning of circuit boards and especially with cleanness of bore surfaces and Kukanskis teaches an effective cleaning of such surfaces utilizing substantially clear mixture comprised a water-immiscible **organic liquid and water,** one skilled in the art at the time the invention was made, motivated by the teaching of Kukanskis, would have found it obvious to utilize the clear mixture of Kukanskis as a cleaning liquid in order to treat the circuit boards and especially the small bores surfaces in GB'434 with the reasonable expectation of success, and thus to arrive at the instantly claimed subject matter.

With regard to the limitation of the new claim 12 that recites that the liquid is supplied in a direction only along a direction of centrifugal force, Applicants attention is drawn to a definition of a centrifugal force that is "an outward directed "fictitious force"

exerted on a body when it moves azimuthally in a non-inertial rotating reference frame. (the definition from the dictionary is attached hereto). The disclosure of GB' provides that the carrier is rotatably supported on the fitting of the housing, with the axis of rotation standing substantially vertically, while the plane of the parts (surface of substrate) is directed at least approximately radially to the rotation axis (page 3, lines 34-40). GB'434 further teaches that on further increase of rotation speed finally the centrifugal effect **predominates more and more**, and water flows at great force radially outwards over the surfaces of the parts. Therefore, a person skilled in the art taking into account that the plane of the parts is directed at least approximately radially to the rotation axis, and the definition of a centrifugal force accepted in the art, would have expected that the supply of liquid to the substrate, as per GB'434, is reasonably provided in only the direction of centrifugal force.

Response to Arguments

5. Applicant's arguments filed July 28, 2003 have been fully considered but they are not persuasive. With regard to claims 1, 3, and 6 the crux of Applicants arguments is that GB'434

a) does not teach the supplying of cleaning liquid only in a direction conforming with that of centrifugal force;

b) states that the cleaning liquid is supplied in a variety of directions, and by this arrangement the cleaning liquid can be distributed better over parts 37 with the aim of improving cleaning effect.

In response to this, with regard to argument (a) it is noted that the instant claim 1 recites two alternative options for supplying the liquid: one direction is "only in a direction conforming with that of centrifugal force" (see lines 10, 11 of claim 1), **OR** (*emphasis added-M.K.)* "with that of a flow of said desired liquid flowing on said substrate **under** *(emphasis added-M.K.)* said centrifugal force". It is absolutely clearly shown in GB'434 and described in details in paragraph 3 above that the liquid is flowing on the substrate **under** centrifugal force. GB'434 further teaches that on further increase of rotation speed finally the centrifugal effect **predominates more and more**, and water flows at great force radially outwards over the surfaces of the parts (see also col.2, lines 127-130). See also the definition of "centrifugal force" above. This clearly reads on the optional limitation of claim 1 and at the least makes obvious a limitation of new claim 12. Therefore, with regard to 35 USC 102 ((b) rejections, Applicants arguments are much more specific that the claims.

With regard to Applicants' argument (b), this argument resides in contention that the improved cleaning effect in GB'434 is achieved by providing the cleaning liquid in a variety of directions, and Applicants cite specific passages in GB'434 allegedly justifying that statement (page3, line 114 to page 4, line 4). After carefully reviewing the above passage, Examiner failed to find any indication in GB'434 stating that spraying liquid in a variety of directions improves the cleaning effect. To the contrary, the above passage teaches that it is the rotation accompanying the spray nozzle that allows to achieve an improved cleaning effect (page 4, lines 1-5).

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (703) 305-0400. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (703) 308-4333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 2450.

Michael Kornakov
Examiner
Art Unit 1746

MK

RANDY GULAKOWSKI
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